Non-Technical Abstract.

Up to 80% of patients with cancer ultimately suffer from chronic pain [1], the most common cause of which is tumor that has spread to bone. While pain-killing (analgesic) medications are effective early, many of these patients require high doses of narcotic analgesics. The side effects of these drugs limit the dose that may be given, and have a serious adverse impact on quality of life. Drugs like narcotic analgesics act through receptors for naturally-produced "opioid peptides". Although the existence of opioid peptides has been known for more than 25 years, these peptides have not yet been adapted for therapeutic purposes because of their very short half-life and difficulty in administration.

We have created a recombinant gene transfer "vector" based on the human herpes simplex virus, a virus that in its naturally-occurring form causes the common cold sore. The recombinant vector has been modified it two ways: (1) critical genes have been removed from the virus so that it cannot reproduce itself, and (2) a gene coding for an opioid peptide (proenkephalin) has been inserted into the modified vector. In animal studies we have found that inoculation of this vector into the skin of animals provides an analgesic effect in several different models of pain, including pain caused by cancer in bone.

In this study, we will test the safety of this new vector. We will recruit 18 patients with cancer that has spread to the bones of the spine, causing severe untreatable pain in that region. We will inject the vector under the skin and follow the patients for any adverse effects, as well as examine them for any response to the treatment.